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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BEKELE, MEKONEN T

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/535,068	Applicant(s) OKOCHI, TAKAYUKI	
	Examiner MEKONEN BEKELE	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05/13/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/29/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-17 are pending in this application.

Priority

2. Acknowledgement is made of application's claim for foreign priority under 35 U.S.C. 119 (a)-(d) based on the Japanese patent application No. 2002-330131 filed on 11/13/2002. The certified copy has been filed in parent application No. 10/535068, filed on 11/13/2002.

Drawings

3. The Drawings filed on 07/11/2005 are accepted for examination.

Information Disclosure Statement

4. The information discloser statements field on 07/29/2005 is in compliance with the provisions of 37 CFR 1.97, and has been considered and copies are enclosed with this Office Action

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of

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"data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

5. Claims 16 and 17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Regarding claim 16, "an equipment" recited in the preamble is defined as a software program in the specification. This is evident from the drawings which showed an algorithmic simulation flow chart. Thus, claim 16 defines a computer program embodying functional descriptive material. However, the claim does not define a computer-readable medium or computer-readable memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the

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recited program. The examiner suggests amending the claim(s) to embody the program on “computer-readable medium” or equivalent; assuming the specification does NOT define the computer readable medium as a “signal”, “carrier wave”, or “transmission medium” which are deemed non-statutory (refer to “note” below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

“A transitory, propagating signal ... is not a “process, machine, manufacture, or composition of matter.” Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter.” (*In re Petrus A.C.M. Nuijten*; Fed Cir, 2006-1371, 9/20/2007).

Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a “signal”, the claim as a whole would be non-statutory. In the case where the specification defines the computer readable medium or memory as statutory tangible products such as a hard drive, ROM, RAM, etc, as well as a non-statutory entity such as a “signal”, “carrier wave”, or “transmission medium”, the examiner suggests amending the claim to include the disclosed tangible computer readable media, while at the same time excluding the intangible media such as signals, carrier waves, etc.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1-17 are rejected under 35 U.S.C. 102(a) as being anticipated by Takayuki OKOCHI et al., "Application of pattern analysis to dendrochronology" Program and Proceedings of ICIS'2, Tokyo: International Congress of Imaging Science 2002, Tokyo, 13 May 2002 p. 441-44

As to claim 1, Takayuki teaches A method for measuring feature points of a waveform signal (**Abstract: A method of measuring tree-ring patterns through digital image processing**. The feature points of a waveform signal corresponds to **the tree ring patterns recognized through signal processing**) having irregular feature point values (**Fig. 2, page 1 col.1 lines 33-35, the wave form signal which has irregular wave form**) or irregular distances between the feature points(**Fig. 2, page 1 col.1 lines 33-35, the wave form has variable amplitude**), said method comprising the steps of: performing wavelet conversion(**page 1, col.2 lines 25-26**) of the waveform signal (**page 1, col.2 lines 26-27, equation 1**) within a predetermined interval(**page 2. col. 1, line 4: see interval $[x - 2^{-jd} a, x + 2^{-jda} a]$**) by using a predetermined mother wavelet (**page 2. col. 1, lines 3-4**) and multiple scale levels (**page 2. col. 2 lines 30-32, scale level 2^j with a multiple level J**); calculating squared mean (**page 2 equation 2, equation 2 corresponds to the squared mean**) for interval for each interval width (**page 2 equation 2, evaluating equation 2 using the limit of integration $x - 2^{-jd} a, x + 2^{-jda}$ for all j**. Each interval width **corresponds to the interval $[x - 2^{-jd} a, x + 2^{-jd} a]$ for all j**) corresponding to said scale levels in relation to a wavelet conversion signal (**page 1, col.2 lines 26-28, wavelet conversion for one dimension image signal**) for each scale level(**scale level 2^j for all level J**) generated by the said wavelet conversion; defining a scale level at a point where the calculated value of the said

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squared mean for interval becomes maximum at an arbitrary point (page 1 col.2 paragraph3, in one point x , level j that becomes maximum of $g_i(x)$ is dominant level j_d , where $g_i(x)$ is used to evaluate the square mean. The arbitrary point corresponds to the one point x) within the predetermined interval (the interval $[x - 2^{-j_d}a, x + 2^{-j_d}a]$), as a dominant level (dominant level j_d ,) for that point; and detecting points at which the said waveform signal reaches maximum value (Fig.1 interval maximum value detection block,) or minimum value for each interval width corresponding to the dominant level, as the feature points of the waveform signal.

As to claim 2, Takayuki teaches said wavelet conversion (page. 1 col.2 2nd paragraph, the wavelet conversion formula) uses the following formula (1), that is,

$$d_j(x) = b^j \int_{-\infty}^{\infty} \phi(b^j(x-k)) f(x) dx \quad \dots(1)$$

(page. 1 col.2 2nd paragraph, equation 1, with $b = 2$ both equations are identical) where $f(x)$ is the waveform signal (page. 1 col.2, 2nd paragraph, $f(x)$ is a signal on measuring line), $\psi(x)$ is the mother wavelet (page. 1 col.2, 2nd), b^j is a scaling parameter (page. 1 col.2, 2nd paragraph, 2^j is a scalar parameter. The term b corresponds to 2), b is a constant ($b > 1$), j is a scale level (page. 1 col.2, 2nd paragraph, 2^j is a scalar parameter, level j) comprised of zero or a negative whole number (page. 1 col.2, 2nd paragraph, J is 0 or negative integer number. The set negative integer numbers includes the set of negative whole numbers), and k is a translating parameter (page. 1 col.2, 2nd).

As to claim 3, Takayuki teaches said mother wavelet uses a French hat wavelet transform (page 2 col.1 1st paragraph, a French-hat type function) which is defined

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by the following formula (2), that is

$$\psi(x) = \begin{cases} 1 & -1 \leq x \leq 1 \\ -0.5 & -3 \leq x < -1, \text{ or } 1 < x \leq 3 \\ 0 & x < -3, \text{ or } 3 < x \end{cases} \quad \dots(2)$$

(page 2 col.1 1st paragraph equation 3).

As to claim 4, Takayuki teaches mother wavelet is a Mexican hat wavelet transform which is defined by the following formula (3), that is,

$$\phi(x) = -\frac{1}{2} \frac{d^2}{dx^2} e^{-x^2} = (1 - 2x^2)e^{-x^2} \quad \dots(3)$$

It would have been obvious to one the ordinary skill in the art to use Gabor function, Mexican hat function, French f hat unction, Haar function, or the like as wavelet transformation functions. Thus Mexican hat function and French hat function, given by equation 3, are equivalent.

As to claim 5, Takayuki teaches said calculation of the squared mean (**page 2 1st paragraph equation 2**, the square **mean corresponds to equation 2**) for interval (see **the integration interval of equation 2**) uses the following formula (4), that is,

$$g_j(x) = 2^{-j} p_j^{-1} \int_{x-p_j}^{x+p_j} |d_j(k)|^2 dk \quad \dots(4)$$

(**page 2 col. 1 equation 2**, the term $a^{-1} 2^j$ of **equation 2** corresponds to the term p_j^{-1} of equation 4 . **Thus equation 4 and equation 2 are identical**)

where j is the scale level used in the formula (1) (**page. 1 col.2, 2nd paragraph**, 2^j is a scalar parameter, level j), k is the translating parameter (**page. 1 col.2, 2nd paragraph**), and p_j is a constant that is set according to scale level j (**page 2 col. 1**

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equation 2, the term $a^{-1} 2^j$ of equation 2 corresponds to **the term p_j^{-1} of equation 4**.

Since a is a constant, **page 2 col.1 1st paragraph**, and j is zero or negative integer, $a^{-1} 2^j$ **is set of constants**) so that the constant p_j becomes larger as the scale level j becomes lower(**the term p_j corresponds to the term $a 2^j$, thus term $a 2^j$ becomes larger as the level j becomes lower**).

As to claim 6, Takayuki teaches p_j in said formula (4) (**page 2 col. 1 equation 2**) for the calculation of the squared mean for interval is defined by the following formula (5), that is,

$$p_j = b^{-j} a \quad \dots (5)$$

(**page 2 col. 1 equation 2**, the term p_j^{-1} of equation 4 **corresponds to the term $a^{-1} 2^j$ of equation 2**. Thus term $p_j = b^{-j} a$ of equation 4 **corresponds to term $a^{-1} 2^j$ of equation 2**, and the term b of equation 4 **corresponds to 2**)

where a is a constant determined by the support of the mother wavelet $\psi(x)$ (**page 2 col. 1 1st paragraph**) used in the formula (1)(**page 1 col. 2 equation 1**), b is the constant (**b corresponds to 2 so it is a constant**) used in the formula (1), and j is the scale level (**page. 1 col.2, 2nd paragraph, 2^j is a scalar parameter, level j**) used in the formula (1).

As to claim 7, Takayuki teaches the value of b in said formula (1) is 2.(**page 2 col. 1 equation 2**, the term p_j^{-1} of equation 4 **corresponds to the term $a^{-1} 2^j$ of equation 2**. Thus b **is equal to 2**).

As to claim 8, Takayuki teaches said waveform signal is a pixel light intensity or density information signal(**page 1. col.2 Fig.1, the BGR format of pixel density is obtained by scanning and BGR- to Density conversion process**) acquired from a target image such as wood specimen tree ring images (**page 1 col.1 5th paragraph, Fig. 1, the process tree ring wave form recognition such as Sugi tree**) is or the like along a measurement line configured on said image.

As to claim 9, Takayuki teaches said waveform signal is a pixel light intensity or density In formation signal acquired from a target image such as wood specimen tree ring image or the like along a measurement line configured on said target image that is further subjected to differential processing (**page. 1 Fig. 1, col. 2 , 2nd paragraph, the density information of the BRG format pixel is smoothed and transformed using wavelet conversion. The differential processing corresponds to the wavelet conversion**).

As to claim 10, Takayuki said differential processing is a calculus of finite differences (**page. 1 col. 2 equation 1, wavelet transformation using wavelet integrals**) between multiple pixels(**page 2. col. 1 3rd paragraph, multiple pixels that range from 4,000 to 9, 000 in each measuring line**), separated by an interval (**Fig. 2 on page 2**) of several pixels.

As to claim 11, Takayuki teaches when said waveform signal is a density information signal (**page 1. Fig. 1, density information of the BRG format pixel**), said density information signal is $f(x)$ (**page 1 col.2 equation 1, in equation 1 $f(x)$ is a**

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signal measuring line), said dominant level is j_d (page 1 col.2 3rd paragraph), a constant corresponding to said dominant level is q_{jd} (page 2 col.1 1st paragraph, the term q_{jd} corresponds to the term 2^{-jd} and it is constant), and an arbitrary point on said measurement line is x (page 2 col.1 1st paragraph), then when the value of $f(x)$ is equivalent to the maximum value $f_{\max}(x)$ of $f(x)$ of the interval $[x - q_{jd}, x + q_{jd}]$ (page 2 col.1 1st paragraph, $f(x)$ is equal to maximum $f(x)$ in the interval $[x - 2^{-jd}, x + 2^{-jd}]$), the point x is determined as the feature point which indicates the maximum density point within the tree ring layer (page 2 col.1 1st paragraph x is the maximum density point on the tree ring).

As to claim 12, Takayuki teaches when said waveform signal is a differential signal obtained by differential processing of a density information signal (page 1. Fig. 1, density information of the BRG format pixel), said differential signal is $f(x)$ (page 1 col.2 equation 1, in equation 1 $f(x)$ is a signal measuring line), said dominant level is j_d (page 1 col.2 3rd paragraph), the constant corresponding to said dominant level is q_{jd} page 2 col.1 1st paragraph, the term q_{jd} corresponds to the term 2^{-jd} and it is constant), and an arbitrary point on said measurement line is x (page 2 col.1 1st paragraph), then when the value of $f(x)$ is equivalent to the minimum value $f_{\min}(X)$ of $f(x)$ of the interval $[x - q_{jd}, x + q_{jd}]$ (page 2 col.1 1st paragraph, $f(x)$ is equal to maximum $f(x)$ in the interval $[x - 2^{-jd}, x + 2^{-jd}]$. Thus the calculation of maximum or the calculation of minimum are equivalent), the point x is determined as the feature point which indicates the late wood end within the tree ring layer (page 2 col.1 1st paragraph, The method using the maximum density recognize all the tree-rings on the measuring line. Thus the minim density fail to recognize all the tree-rings on the measuring line).

As to claim 13, Takayuki teaches said measurement line is comprised of a main measurement line(**Fig. 2, the graphs shows the wave form on the main measuring line**) and multiple subordinate measurement lines(**Fig. 2, the dot lines and the star lines corresponds to** multiple subordinate measurement lines) which are equidistant parallel lines (**see Fig.2**) on either side of said main measurement line, and when waveform signal feature points are detected(**Fig.2, recognizing points by mutual comparison**) at a point that is the same distance from the starting end (**Fig.2, End point of each tree ring**) on said main measurement line and subordinate measurement lines, then those feature points are determined to be a feature point (**page 2, col.1 1st paragraph, Fig. 2, the dominate level on the wave form on measuring line**) on the main measurement line(**Fig.2, the main measuring lines is the line where wave form is plotted**) provided that one of the conditions is that the number of said feature points comprises at least a majority in relation to the number of measurement lines including the main measurement line and subordinate measurement lines (**Fig. 2 shows recognized points on five measuring lines that includes main measuring line, and the two parallel lines which are equivalent to the subordinated lines**).

As to claim 14, Takayuki teaches, two subordinate measurement lines (**Fig.2, the dot line and the stare line corresponds to the** two subordinate measurement lines) are configured respectively at both sides of said main measurement line (**Fig. 2, all the three lines are on the same screen**), and when waveform signal feature points (**Fig. 2, wave form on the main measuring line**) are detected at a point that is roughly the same distance from the starting end on said main measurement line) and subordinate measurement lines(**Fig. 2 the recognized points on the five measuring**

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line at the end point of each tree- ring indicated by the dominate level signal) , and when feature points are found on the main measurement line and on at least one of the two subordinate measurement lines that are positioned adjacent to said main measurement line (**Fig. 2 the dot line and the star line are adjacent to the main measurement lines**), and on at least one of the other subordinate measurement lines(**the dot line**), and when feature points are found on the two subordinate measurement lines that are positioned adjacent to the main measurement line , and on the other subordinate measurement line, those feature points are determined to be a feature point on the main measurement line (**Fig. 2, the recognized points on the five measuring line at the end point of each tree- ring indicated by the dominate level signal**).

As to claim 15, Takayuki teaches a smoothing process (**Fig.1 smoothing density information of the BRG format pixel**) using peripheral pixel information (Fig.1, **using the BRG format pixels information**) is performed on the pixel light intensity or density information (page 1. Fig. 1, **density information of the BRG format pixels value**) acquired from the target image (**the tree- ring image**) along the measurement lines configured on the target image (**Fig. 2, wave form on the main measuring line**).

Regarding claim 16, all the claim limitations are set forth and rejected as per discussion for claim 1.

As to claim 17, Takayuki teaches distance calculating means for calculating distances between the feature points on the basis of the detected feature points of the waveform signal (page.1 equation 1, **Equation 1 corresponds to calculating means for calculating distances between the tree-rings**).

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Any inquiry concerning this communication or earlier communication from the examiner should be directed to Mekonen Bekele whose telephone number is 571-270-3915. The examiner can normally be reached on Monday -Friday from 8:00AM to 5:50 PM Eastern Time.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor LE BRIAN can be reached on **(571) 272-7424**. The fax phone number for the organization where the application or proceeding is assigned is 571-237-8300.

Information regarding the status of an application may be obtained from the patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

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/MEKONEN BEKELE/
Examiner, Art Unit 2624
Monday, August 25, 2008

/Brian Q Le/

Examiner, Art Unit 2624